

**CPC****COOPERATIVE PATENT CLASSIFICATION****H01Q**

**AERIALS** (microwave radiators for near-field therapeutic treatment [A61N 5/04](#); apparatus for testing aerials or for measuring aerial characteristics [G01R](#); waveguides [H01P](#); radiators or aerials for microwave heating [H05B 6/72](#))

**NOTE**

This subclass covers:

- in addition to the primary active radiating elements,
  - a) secondary devices for absorbing or for modifying the direction or polarisation of waves radiated from aerials, and
  - b) combinations with auxiliary devices such as earthing switches, lead-in devices, and lightning protectors;
- both transmitting and receiving aerials

This subclass does not cover devices of the waveguide type, such as resonators or lines, not designed as radiating elements, which are covered by subclass H01P.

In this subclass, the following expression is used with the meaning indicated:

- "active radiating element" covers corresponding parts of a receiving aerial.

**WARNING**

[C2012.08]

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups : - [H01Q 5/01](#) covered by [H01Q 5/0003](#) to [H01Q 5/0096](#)- [H01Q 5/02](#) covered by [H01Q 5/0003](#) to [H01Q 5/0096](#)]

**H01Q 1/00**

**Details of, or arrangements associated with, aerials** (arrangements for varying orientation of directional pattern [H01Q 3/00](#))

**NOTE**

This group covers only:

- structural details or features of aerials not dependent on electric operation;
- structural details or features applicable to more than one type of aerial or aerial element.

Structural details or features described with reference to, or clearly applicable only to, aerials or aerial elements of a particular type are classified in the group appropriate to that type.

**H01Q 1/002**

- . {Protection against seismic waves, thermal radiation or other disturbances, e.g. nuclear explosion; Arrangements for improving the power handling capability of an

- aerial ([cooling H01Q 1/02](#))
- H01Q 1/005 . {Damping of vibrations; Means for reducing wind-induced forces ([damping of vibrations in general F16F](#))}
- H01Q 1/007 . {specially adapted for indoor communication}
- H01Q 1/02 . Arrangements for de-icing; Arrangements for drying-out; {Arrangements for cooling; Arrangements for preventing corrosion ([radomes H01Q 1/42](#))}
- H01Q 1/04 . Adaptation for subterranean or subaqueous use
- H01Q 1/06 . Means for the lighting or illuminating of aerials, e.g. for purpose of warning
- H01Q 1/08 . Means for collapsing aerials or parts thereof; {Collapsible aerials}{collapsible supports [H01Q 1/1235](#); collapsible loop aerials [H01Q 7/02](#); collapsible helical aerials [H01Q 11/086](#); collapsible reflecting surfaces [H01Q 15/161](#), [H01Q 15/20](#); collapsible H-aerials or Yagi aerials [H01Q 19/04](#)}
- H01Q 1/081 .. {Inflatable antennas}
- H01Q 1/082 ... {Balloon antennas ([balloon supported antennas H01Q 1/1292](#))}
- H01Q 1/084 .. {Pivotable antennas ([mechanical movement of aerial or aerial system for changing or varying the orientation or the shape of the directional pattern H01Q 3/02](#); [adjustment of angle between two radiating elements H01Q 9/12](#))}
- H01Q 1/085 .. {Flexible aerials; Whip aerials with a resilient base}
- H01Q 1/087 ... {Extensible roll- up aerials}
- H01Q 1/088 .. {Quick-releasable antenna elements}
- H01Q 1/10 .. Telescopic elements
- H01Q 1/103 ... {Latching means; ensuring extension or retraction thereof}
- H01Q 1/106 ... {Means for locking or protecting against unauthorized extraction}
- H01Q 1/12 . Supports; Mounting means ({for the purpose of scanning [H01Q 3/00](#); mounting structure for reflecting surfaces [H01Q 15/14](#); Towers, masts, or poles [E04H 12/00](#); supporting conductors in general [H02G 7/00](#))}
- H01Q 1/1207 .. {for fastening a rigid aerial element}
- H01Q 1/1214 ... {through a wall}
- H01Q 1/1221 ... {onto a wall}
- H01Q 1/1228 ... {on a boom ([coupling of tubular pipes F16B 7/04](#))}
- H01Q 1/1235 .. {Collapsible supports; Means for erecting a rigid antenna}
- H01Q 1/1242 .. {Rigid masts specially adapted for supporting an aerial}
- H01Q 1/125 .. {Means for positioning ([stabilising H01Q 1/18](#); [remotely controlled positioning H01Q 3/005](#))}
- H01Q 1/1257 ... {using the received signal strength ([direction finding G01S 3/38](#); [diversity H04B 7/10](#))}
- H01Q 1/1264 ... {Adjusting different parts or elements of an aerial unit}
- H01Q 1/1271 .. {for mounting on windscreens}
- H01Q 1/1278 ... {in association with heating wires or layers}
- H01Q 1/1285 ... {with capacitive feeding through the windscreen}

- H01Q 1/1292 . . {for mounting on balloons}
- H01Q 1/14 . . for wire or other non-rigid radiating elements
- H01Q 1/16 . . . Strainers, spreaders, or spacers
- H01Q 1/18 . . Means for stabilising aerials on an unstable platform {(reducing wind-induced forces [H01Q 1/005](#))}
- H01Q 1/185 . . . {by electronic means (electronic scanning [H01Q 3/26](#))}
- H01Q 1/20 . . Resilient mountings
- H01Q 1/22 . . by structural association with other equipment or articles {(portable transceivers [H04B 1/3827](#))}
- H01Q 1/2208 . . . { associated with components used in interrogation type services, i.e. in systems for information exchange between an interrogator/reader and a tag/transponder, e.g. in Radio Frequency Identification (RFID) systems ([G06K 7/00](#) and [G06K 19/00](#) take precedence)}
- H01Q 1/2216 . . . { used in interrogator/reader equipment}
- H01Q 1/2225 . . . { used in active tags, i.e. provided with its own power source or in passive tags, i.e. deriving power from RF signal}
- H01Q 1/2233 . . . { used in consumption-meter devices, e.g. electricity, gas or water meters (remote reading of utility meters [G01D 4/002](#); transmission of measured values using a radio link in general [G08C 17/02](#))}
- H01Q 1/2241 . . . { used in or for vehicle tyres (tyres in general [B60C 3/04](#))}
- H01Q 1/225 . . { used in level-measurement devices, e.g. for level gauge measurement (level measuring with electromagnetic waves in general [G01F 23/284](#))}
- H01Q 1/2258 . . { used with computer equipment}
- H01Q 1/2266 . . . { disposed inside the computer}
- H01Q 1/2275 . . . { associated to expansion card or bus, e.g. in PCMCIA, PC cards, Wireless USB}
- H01Q 1/2283 . . { mounted in or on the surface of a semiconductor substrate as a chip-type antenna or integrated with other components into an IC package (chip carriers for flat cards [H01L 23/49855](#))}
- H01Q 1/2291 . . { used in bluetooth or WI-FI devices of Wireless Local Area Networks (WLAN) ([H01Q 1/241](#) takes precedence; WLAN in general [H04L 12/28W](#))}
- H01Q 1/24 . . with receiving set
- H01Q 1/241 . . . {used in mobile communications, e.g. GSM ([H01Q 1/247](#), [H01Q 1/248](#) take precedence)}
- H01Q 1/242 . . . {specially adapted for hand-held use}
- H01Q 1/243 . . . {with built-in antennas}
- H01Q 1/244 . . . {extendable from a housing along a given path}
- H01Q 1/245 . . . {with means for shaping the antenna pattern, e.g. in order to protect user against rf exposure}
- H01Q 1/246 . . . {specially adapted for base stations}
- H01Q 1/247 . . {with frequency mixer, e.g. for direct satellite reception or Doppler radar (active antennas [H01Q 23/00](#))}
- H01Q 1/248 . . {provided with an AC/DC converting device, e.g. rectennas}
- H01Q 1/26 . . with electric discharge tube
- H01Q 1/27 . . Adaptation for use in or on movable bodies ([H01Q 1/08](#), [H01Q 1/12](#), [H01Q 1/18](#) take precedence; {portable transceivers [H04B 1/3827](#)})

- H01Q 1/273 .. {Adaptation for carrying or wearing by persons or animals}
- H01Q 1/276 ... {for mounting on helmets}
- H01Q 1/28 .. Adaptation for use in or on aircraft, missiles, satellites, or balloons
- H01Q 1/281 ... {Nose antennas}
- H01Q 1/282 ... {Modifying the aerodynamic properties of the vehicle, e.g. projecting type aerials}
- H01Q 1/283 .... {Blade, stub antennas}
- H01Q 1/285 ... {Aircraft wire antennas (means for trailing [H01Q 1/30](#))}
- H01Q 1/286 ... {substantially flush mounted with the skin of the craft}
- H01Q 1/287 .... {integrated in a wing or a stabiliser}
- H01Q 1/288 ... {Satellite antennas}
- H01Q 1/30 ... Means for trailing aerials
- H01Q 1/32 .. Adaptation for use in or on road or rail vehicles ([telescopic elements H01Q 1/10](#); [resilient mountings for aerials H01Q 1/20](#))
- H01Q 1/3208 ... {characterised by the application wherein the antenna is used}
- H01Q 1/3216 .... {where the road or rail vehicle is only used as transportation means}
- H01Q 1/3225 .... {Cooperation with the rails or the road}
- H01Q 1/3233 .... {particular used as part of a sensor or in a security system, e.g. for automotive radar, navigation systems}
- H01Q 1/3241 ..... {particular used in keyless entry systems}
- H01Q 1/325 ... {characterised by the location of the antenna on the vehicle}
- H01Q 1/3258 .... {using the gutter of the vehicle; Means for clamping a whip aerial on the edge of a part of the vehicle}
- H01Q 1/3266 .... {using the mirror of the vehicle}
- H01Q 1/3275 .... {mounted on a horizontal surface of the vehicle, e.g. on roof, hood, trunk}
- H01Q 1/3283 .... {side-mounted antennas, e.g. bumper-mounted, door-mounted ([mounted on windcreens H01Q 1/1271](#))}
- H01Q 1/3291 .... {mounted in or on other locations inside the vehicle or vehicle body}
- H01Q 1/34 .. Adaptation for use in or on ships, submarines, buoys, or torpedoes ([for subaqueous use H01Q 1/04](#); [retractable loop aerials H01Q 7/02](#))
- H01Q 1/36 . Structural form of radiating elements, e.g. cone, spiral, umbrella; {Particular materials used therewith}([H01Q 1/08](#), [H01Q 1/14](#) take precedence)
- H01Q 1/362 .. {for broadside radiating helical antennas}
- H01Q 1/364 .. {using a particular conducting material, e.g. superconductor}
- H01Q 1/366 ... {using an ionized gas}
- H01Q 1/368 ... {using carbon or carbon composite}
- H01Q 1/38 .. formed by a conductive layer on an insulating support ({[patch antennas H01Q 9/0407](#); [microstrip dipole antennas H01Q 9/065](#); [microstrip slot antenna H01Q 13/106](#); [transmission line microstrip antennas H01Q 13/206](#); [manufacturing reflecting surfaces using insulating material for supporting the reflecting surface H01Q 15/142](#)}; [conductors in general H01B 5/14](#))
- H01Q 1/40 . Radiating elements coated with or embedded in protective material
- H01Q 1/405 .. {Radome integrated radiating elements}

- H01Q 1/42 . Housings not intimately mechanically associated with radiating elements, e.g. radome
- H01Q 1/421 . . {Means for correcting aberrations introduced by a radome}
- H01Q 1/422 . . {comprising two or more layers of dielectric material ([H01Q 1/425](#) takes precedence)}
- H01Q 1/424 . . . {comprising a layer of expanded material}
- H01Q 1/425 . . {comprising a metallic grid}
- H01Q 1/427 . . {Flexible radomes}
- H01Q 1/428 . . {Collapsible radomes; rotatable, tiltable radomes}
  
- H01Q 1/44 . using equipment having another main function to serve additionally as an aerial; {Means for giving an aerial anaesthetic aspect}([H01Q 1/28](#) to [H01Q 1/34](#) take precedence)
- H01Q 1/46 . . Electric supply lines or communication lines {(circuits for signal transmission via power distribution lines [H04B 3/56](#))}
  
- H01Q 1/48 . Earthing means; Earth screens; Counterpoises ([earthing pins](#) [H01R 4/66](#))
  
- H01Q 1/50 . Structural association of aerials with earthing switches, lead-in devices or lightning protectors ([lead-in devices](#) [H01B](#); [lightning protectors, switches](#) [H01H](#))
  
- H01Q 1/52 . Means for reducing coupling between aerials; Means for reducing coupling between an aerial and another structure {(absorbing means [H01Q 17/00](#))}
- H01Q 1/521 . . {reducing the coupling between adjacent antennas}
- H01Q 1/523 . . . {between antennas of an array}
- H01Q 1/525 . . . {between emitting and receiving antennas ([feed-through nulling for radar](#) [G01S 7/038](#))}
- H01Q 1/526 . . {Electromagnetic shields ([anechoic chambers](#) [G01R 29/105](#); shielding of instruments [G12B 17/00](#), of CRT [H01J 29/867](#), of electrical apparatus or components [H05K 9/00](#))}
- H01Q 1/528 . . {reducing the reradiation of a support structure ([in a parabolic reflector antenna](#) [H01Q 19/023](#))}
  
- H01Q 3/00** **Arrangements for changing or varying the orientation or the shape of the directional pattern of the waves radiated from an aerial or aerial system {(means for positioning [H01Q 1/125](#))}**
  
- H01Q 3/005 . {using remotely controlled aerial positioning or scanning ([remote control in general](#) [G08C](#))}
  
- H01Q 3/01 . varying the shape of the aerial or aerial system
  
- H01Q 3/02 . using mechanical movement of aerial or aerial system as a whole
- H01Q 3/04 . . for varying one co-ordinate of the orientation
- H01Q 3/06 . . . over a restricted angle
- H01Q 3/08 . . for varying two co-ordinates of the orientation
- H01Q 3/10 . . . to produce a conical or spiral scan
  
- H01Q 3/12 . using mechanical relative movement between primary active elements and secondary

- devices of aerials or aerial systems {(positioning [H01Q 1/1264](#))}
- H01Q 3/14 . . for varying the relative position of primary active element and a refracting or diffracting device
- H01Q 3/16 . . for varying relative position of primary active element and a reflecting device
- H01Q 3/18 . . . wherein the primary active element is movable and the reflecting device is fixed
- H01Q 3/20 . . . wherein the primary active element is fixed and the reflecting device is movable
- H01Q 3/22 . varying the orientation in accordance with variation of frequency of radiated wave
- H01Q 3/24 . varying the orientation by switching energy from one active radiating element to another, e.g. for beam switching
- H01Q 3/242 . . {Circumferential scanning}
- H01Q 3/245 . . {in the focal plane of a focussing device}
- H01Q 3/247 . . {by switching different parts of a primary active element}
- H01Q 3/26 . varying the relative phase or relative amplitude of energisation between two or more active radiating elements; varying the distribution of energy across a radiating aperture ([H01Q 3/12](#), [H01Q 3/22](#), [H01Q 3/24](#) take precedence; {use of steered beams for mobile service area coverage [H04Q 7/3615](#)})
- H01Q 3/2605 . . {Array of radiating elements provided with a feedback control over the element weights, e.g. adaptive arrays (tracking [G01S 3/42](#))}
- H01Q 3/2611 . . . {Means for null steering; Adaptive interference nulling}
- H01Q 3/2617 . . . . {Array of identical elements}
- H01Q 3/2623 . . . . . {composed of two antennas}
- H01Q 3/2629 . . . . {Combination of a main antenna unit with an auxiliary antenna unit}
- H01Q 3/2635 . . . . . {the auxiliary unit being composed of a plurality of antennas}
- H01Q 3/2641 . . . . . {being secondary elements, e.g. reactively steered}
- H01Q 3/2647 . . . {Retrodirective arrays}
- H01Q 3/2652 . . . {Self-phasing arrays}
- H01Q 3/2658 . . {Phased-array fed focussing structure}
- H01Q 3/2664 . . {electrically moving the phase centre of a radiating element in the focal plane of a focussing device (switching [H01Q 3/245](#), phased-array feeds [H01Q 3/2658](#))}
- H01Q 3/267 . . {Phased-array testing or checking devices (measuring radiation diagrams of aerials [G01R 29/10](#))}
- H01Q 3/2676 . . {Optically controlled phased array (optical fibre networks [H03H 2/003](#))}
- H01Q 3/2682 . . {Time delay steered arrays}
- H01Q 3/2688 . . . {using acoustic or magnetostatic wave devices}
- H01Q 3/2694 . . . {using also variable phase-shifters ([H01Q 3/2688](#) takes precedence)}
- H01Q 3/28 . . varying the amplitude
- H01Q 3/30 . . varying the {relative} phase {between the radiating elements of an array ([H01Q 3/2605](#), [H01Q 3/2658](#), [H01Q 3/2682](#), [H01Q 3/44](#) take precedence)}
- H01Q 3/32 . . . by mechanical means
- H01Q 3/34 . . . by electrical means (active lenses or reflecting arrays [H01Q 3/46](#))
- H01Q 3/36 . . . . with variable phase-shifters {(combined with time delay devices [H01Q 3/2682](#))}

- H01Q 3/38 . . . . . the phase-shifters being digital
- H01Q 3/385 . . . . . {Scan control logics}
- H01Q 3/40 . . . . . with phasing matrix
- H01Q 3/42 . . . . . using frequency-mixing {(H01Q 3/2676 takes precedence)}
- H01Q 3/44 . . . . . varying the electric or magnetic characteristics of reflecting, refracting, or diffracting devices associated with the radiating element
- H01Q 3/443 . . . . . {varying the phase velocity along a leaky transmission line (frequency scanning H01Q 3/22; non-resonant leaky-waveguide or transmission-line aeriels H01Q 13/20)}
- H01Q 3/446 . . . . . {the radiating element being at the centre of one or more rings of auxiliary elements}
- H01Q 3/46 . . . . . Active lenses or reflecting arrays
- H01Q 5/00** **Arrangements for simultaneous operation of aeriels on two or more different wavebands, { e.g. dual- or multi-band like arrangements for broad wavebands}(length of elements adjustable H01Q 9/14; combinations of separate active aerial units operating in different wavebands and connected to a common feeder system H01Q 21/30; { non-simultaneous operation of aeriels with adjustable lengths or elements H01Q 9/14; broad/multi-band operation in general without specific features H01Q 5/00})**
- H01Q 5/0003 . . . . . { Single aerial units operating on two or more wavebands (H01Q 5/02 takes precedence)}
- WARNING**
- H01Q 5/00G, H01Q 5/0024 , H01Q 5/0072 and H01Q 5/00P
- H01Q 5/0006 . . . . . { Imbricated structures (H01Q 5/02 takes precedence)}
- WARNING**
- H01Q 5/00G, H01Q 5/0024 , H01Q 5/0072 and H01Q 5/0093
- H01Q 5/001 . . . . . { Characterized by having two or more different wavebands}
- WARNING**
- Not complete, pending reclassification. See also H01Q 5/0003 and H01Q 5/0006
- H01Q 5/0013 . . . . . { RF wavebands combined with non-RF wavebands, e.g. infrared or optical}
- H01Q 5/0017 . . . . . { Ultra-wide-band or pulse systems, e.g. multiple resonances systems (H01Q 9/005 takes precedence)}
- H01Q 5/002 . . . . . { Achieving other properties, e.g. polarisation or beam width over two or more different wavebands}
- H01Q 5/0024 . . . . . { Arrangements or measures for achieving the different wavebands}
- WARNING**
- Not complete, pending reclassification. See also H01Q 5/0003 and H01Q 5/0006



- H01Q 5/0027 .. { Single fed radiating element, or connected radiating elements at least one of which is fed}
- H01Q 5/0031 ... { using frequency dependent circuits, e.g. capacitors, trap circuits}
- H01Q 5/0034 .... { within a radiating element or between connected radiating elements}
- H01Q 5/0037 .... { between a radiating element and ground}
- H01Q 5/0041 .... { at the feed, e.g. for impedance matching}
- H01Q 5/0044 ... { using different modes ([H01Q 5/0031](#) takes precedence)}
- H01Q 5/0048 .... { using two or more simultaneous feed points on a same radiating element or on the connected radiating elements}
- H01Q 5/0051 .... { using a single feed point}
- H01Q 5/0055 ..... { Creating different current paths, e.g. of the same type}
- H01Q 5/0058 ..... { Branching current paths of the same type}
- H01Q 5/0062 .. { Combination of a fed and one or more additional parasitic elements}
- H01Q 5/0065 ... { At least two additional elements}
- H01Q 5/0068 ... { the additional element itself having dual- or multi-band characteristics}
  
- H01Q 5/0072 . { Imbricated or interleaved structures; Structures otherwise combined or electro-magnetically coupled, e.g. comprising two or more non-connected fed radiating elements ([same feed H01Q 21/30](#); [independent non-interacting antennas H01Q 21/28](#))}

**WARNING**

Not complete, pending reclassification. See also [H01Q 5/0003](#) and [H01Q 5/0006](#)

- H01Q 5/0075 .. { using two or more imbricated arrays ([H01Q 5/0089](#) takes precedence)}
- H01Q 5/0079 .. { using two or more feeds in association with a same reflecting, diffracting or refracting device}
- H01Q 5/0082 ... { with a coaxial arrangement of the feeds}
- H01Q 5/0086 .. { Combinations of dipole type aerials}
- H01Q 5/0089 ... { with parasitic elements not for dual- or multi-band, e.g. imbricated Yagi aerials}
  
- H01Q 5/0093 . { Arrangement for broad- or multi-band operation concerning feeding or matching ([H01Q 9/04K2A6](#) takes precedence)}

**WARNING**

Not complete, pending reclassification. See also [H01Q 5/0003](#) and [H01Q 5/0006](#)

- H01Q 5/0096 .. { For horn or waveguide antennas}
  
- H01Q 5/01 . Resonant aerials
- H01Q 5/02 .. for operation of centre-fed aerials which comprise a single, or two or more collinear, substantially straight elongated active elements

**H01Q 7/00**      **Loop aerials with a substantially uniform current distribution around the loop and having a directional radiation pattern in a plane perpendicular to the plane of the loop**



- H01Q 7/005 . {with variable reactance for tuning the antenna (tuning resonant circuits [H03J](#))}
- H01Q 7/02 . Collapsible aerials; Retractable aerials
- H01Q 7/04 . Screened aerials ([H01Q 7/02](#), [H01Q 7/06](#) take precedence)
- H01Q 7/06 . with core of ferromagnetic material ([H01Q 7/02](#) takes precedence)
- H01Q 7/08 . . Ferrite rod or like elongated core
  
- H01Q 9/00** **Electrically-short aerials having dimensions not more than twice the operating wavelength and consisting of conductive active radiating elements** (loop aerials [H01Q 7/00](#); waveguide horns or mouths [H01Q 13/00](#); slot aerials [H01Q 13/00](#); combinations of active elements with secondary devices to give desired directional characteristic [H01Q 19/00](#); combinations of two or more active elements [H01Q 21/00](#))
  
- H01Q 9/005 . {for radiating non-sinusoidal waves}
- H01Q 9/02 . Non-resonant aerials
- H01Q 9/04 . Resonant aerials
- H01Q 9/0407 . . {Substantially flat resonant element parallel to ground plane, e.g. patch antenna (dipole [H01Q 9/285](#); monopole [H01Q 9/40](#))}
- H01Q 9/0414 . . . {in a stacked or folded configuration}
- H01Q 9/0421 . . . {with a shorting wall or a shorting pin at one end of the element ([H01Q 9/0414](#) takes precedence)}
- H01Q 9/0428 . . . {radiating a circular polarised wave}
- H01Q 9/0435 . . . . {using two feed points}
- H01Q 9/0442 . . . {with particular tuning means}
- H01Q 9/045 . . . {with particular feeding means (for circular polarisation [H01Q 9/0428](#))}
- H01Q 9/0457 . . . . {electromagnetically coupled to the feed line}
- H01Q 9/0464 . . . {Annular ring patch}
- H01Q 9/0471 . . . {Non-planar, stepped or wedge-shaped patch}
- H01Q 9/0478 . . . {with means for suppressing spurious modes, e.g. cross polarisation}
- H01Q 9/0485 . . {Dielectric resonator antennas}
- H01Q 9/0492 . . . {circularly polarised}
- H01Q 9/06 . . Details
- H01Q 9/065 . . . {Microstrip dipole antennas (patch antenna [H01Q 9/0407](#))}
- H01Q 9/08 . . . Junction boxes specially adapted for supporting adjacent ends of collinear rigid elements
- H01Q 9/10 . . . Junction boxes specially adapted for supporting adjacent ends of divergent elements
- H01Q 9/12 . . . . adapted for adjustment of angle between elements
- H01Q 9/14 . . . Length of element or elements adjustable (telescopic elements [H01Q 1/10](#))
- H01Q 9/145 . . . . {by varying the electrical length}
- H01Q 9/16 . . with feed intermediate between the extremities of the aerial, e.g. centre-fed dipole ([H01Q 9/44](#) takes precedence)

- H01Q 9/18 . . . Vertical disposition of the aerial
- H01Q 9/20 . . . Two collinear substantially straight active elements; Substantially straight single active elements ([H01Q 9/28 takes precedence](#))
- H01Q 9/22 . . . . Rigid rod or equivalent tubular element or elements
- H01Q 9/24 . . . . Shunt feed arrangements to single active elements, e.g. for delta matching
- H01Q 9/26 . . . with folded element or elements, the folded parts being spaced apart a small fraction of operating wavelength ([resonant loop aerials H01Q 7/00](#))
- H01Q 9/265 . . . . {Open ring dipoles; Circular dipoles}
- H01Q 9/27 . . . . Spiral aerials
- H01Q 9/28 . . . Conical, cylindrical, cage, strip, gauze, or like elements having an extended radiating surface; Elements comprising two conical surfaces having collinear axes and adjacent apices and fed by two-conductor transmission lines ([biconical horns H01Q 13/04](#))
- H01Q 9/285 . . . . {Planar dipole ([H01Q 9/065 takes precedence](#); patch antenna [H01Q 9/0407](#))}
- H01Q 9/30 . . with feed to end of elongated active element, e.g. unipole ([H01Q 9/44 takes precedence](#))
- H01Q 9/32 . . . Vertical arrangement of element ([H01Q 9/40 takes precedence](#))
- H01Q 9/34 . . . . Mast, tower, or like self-supporting or stay-supported aerials
- H01Q 9/36 . . . . with top loading
- H01Q 9/38 . . . . with counterpoise ([with counterpoise comprising elongated elements coplanar with the active element H01Q 9/44](#))
- H01Q 9/40 . . . Element having extended radiating surface
- H01Q 9/42 . . . with folded element, the folded parts being spaced apart a small fraction of the operating wavelength
- H01Q 9/43 . . . . Scimitar aerials
- H01Q 9/44 . . with plurality of divergent straight elements, e.g. V-dipole, X-aerial; with plurality of elements having mutually inclined substantially straight portions ([turnstile aerials H01Q 21/26](#))
- H01Q 9/46 . . . with rigid elements diverging from single point
  
- H01Q 11/00** **Electrically-long aerials having dimensions more than twice the shortest operating wavelength and consisting of conductive active radiating elements** ([leaky waveguides aerials, slot aerials H01Q 13/00](#); combinations of active elements with secondary devices to give desired directional characteristic [H01Q 19/00](#); aerial arrays or systems [H01Q 21/00](#))
  
- H01Q 11/02 . Non-resonant aerials, e.g. travelling-wave aerial
- H01Q 11/04 . . with parts bent, folded, shaped, screened, or electrically loaded to obtain desired phase relation of radiation from selected sections of the aerial ([rhombic aerials, V-aerials H01Q 11/06](#))
- H01Q 11/06 . . Rhombic aerials; V-aerials
- H01Q 11/08 . . Helical aerials
- H01Q 11/083 . . . {Tapered helical aerials, e.g. conical spiral aerials}
- H01Q 11/086 . . . {collapsible}
- H01Q 11/10 . . Log-periodic aerials {periodic aerials, e.g. length or spacing of elements according to a given law}([H01Q 11/08 takes precedence](#))

- H01Q 11/105 . . . {using a dielectric support}
- H01Q 11/12 . Resonant aerials
- H01Q 11/14 . . with parts bent, folded, shaped, or screened, or with phasing impedances, to obtain desired phase relation of radiation from selected sections of the aerial or to obtain desired polarisation effects
- H01Q 11/16 . . . in which the selected sections are collinear
- H01Q 11/18 . . . . in which the selected sections are parallelly spaced
- H01Q 11/20 . . V-aerials
  
- H01Q 13/00** **Waveguide horns or mouths; Slot aerials; Leaky-waveguide aerials; Equivalent structures causing radiation along the transmission path of a guided wave**  
{multimode aerials [H01Q 25/04](#)}
  
- H01Q 13/02 . Waveguide horns
- H01Q 13/0208 . . {Corrugated horns (waveguide mouth antenna with corrugated flange [H01Q 13/065](#); manufacturing details [H01Q 13/0283](#))}
- H01Q 13/0216 . . . {Dual-depth corrugated horns}
- H01Q 13/0225 . . . {of non-circular cross-section ([H01Q 13/0216](#) takes precedence)}
- H01Q 13/0233 . . {Horns fed by a slotted waveguide array (biconical horns [H01Q 13/06](#))}
- H01Q 13/0241 . . {radiating a circularly polarised wave ([H01Q 13/0258](#) takes precedence; polarisation converters [H01Q 15/244](#), in a waveguide [H01P 1/17](#))}
- H01Q 13/025 . . {Multimode horn antennas; Horns using higher mode of propagation ([H01Q 13/0241](#) takes precedence; multiple beam [H01Q 25/04](#))}
- H01Q 13/0258 . . . {Orthomode horns (Orthomode transducers [H01P 1/161](#))}
- H01Q 13/0266 . . {provided with a flange or a choke}
- H01Q 13/0275 . . {Ridged horns (slot-line radiating ends [H01Q 13/085](#))}
- H01Q 13/0283 . . {Apparatus or processes specially provided for manufacturing horns}
- H01Q 13/0291 . . . {for corrugated horns}
- H01Q 13/04 . . Biconical horns (biconical dipoles comprising two conical surfaces having collinear axes and adjacent apices and fed by a two-conductor transmission line [H01Q 9/28](#))
  
- H01Q 13/06 . Waveguide mouths ([horns H01Q 13/02](#))
- H01Q 13/065 . . {provided with a flange or a choke}
  
- H01Q 13/08 . Radiating ends of two-conductor microwave transmission lines, e.g. of coaxial lines, of microstrip lines
- H01Q 13/085 . . {Slot-line radiating ends}
  
- H01Q 13/10 . Resonant slot aerials
- H01Q 13/103 . . {with variable reactance for tuning the antenna (tuning resonant circuits [H03J](#))}
- H01Q 13/106 . . {Microstrip slot antennas (patch antenna elements [H01Q 9/0407](#))}
- H01Q 13/12 . . Longitudinally slotted cylinder aerials; Equivalent structures
- H01Q 13/14 . . . Skeleton cylinder aerials
- H01Q 13/16 . . Folded slot aerials
- H01Q 13/18 . . the slot being backed by, or formed in boundary wall of, a resonant cavity

longitudinally slotted cylinder [H01Q 13/12](#)); {Open cavity antennas}

- H01Q 13/20 . Non-resonant leaky-waveguide or transmission-line aeralis; Equivalent structures causing radiation along the transmission path of a guided wave {varying the phase velocity [H01Q 3/443](#); near-field transmission systems using leaky cable [H04B 5/0018](#)}
- H01Q 13/203 . . {Leaky coaxial lines}
- H01Q 13/206 . . {Microstrip transmission line antennas}
- H01Q 13/22 . . Longitudinal slot in boundary wall of waveguide or transmission line {(H01Q 13/203 takes precedence)}
- H01Q 13/24 . . constituted by a dielectric or ferromagnetic rod or pipe ([H01Q 13/28](#) takes precedence)
- H01Q 13/26 . . Surface waveguide constituted by a single conductor, e.g. strip conductor
- H01Q 13/28 . . comprising elements constituting electric discontinuities and spaced in direction of wave propagation, e.g. dielectric elements, conductive elements forming artificial dielectric (Yagi aeralis [H01Q 19/30](#))
  
- H01Q 15/00** **Devices for reflection, refraction, diffraction, or polarisation of waves radiated from an aerial, e.g. quasi-optical devices** (variable for purpose of altering directivity [H01Q 3/00](#); arrangements of such devices for guiding waves [H01P 3/20](#); variable for purpose of modulation [H03C 7/02](#))
  
- H01Q 15/0006 . {Devices acting selectively as reflecting surface, as diffracting or as refracting device, e.g. frequency filtering or angular spatial filtering devices ([H01Q 15/12](#), [H01Q 15/22](#), [H01Q 15/24](#) take precedence)}
- H01Q 15/0013 . . { said selective devices working as frequency-selective reflecting surfaces, e.g. FSS, dichroic plates, surfaces being partly transmissive and reflective}
- H01Q 15/002 . . . { said selective devices being reconfigurable or tunable, e.g. using switches or diodes}
- H01Q 15/0026 . . . { said selective devices having a stacked geometry or having multiple layers}
- H01Q 15/0033 . . . { used for beam splitting or combining, e.g. acting as a quasi-optical multiplexer ([H01Q 19/191](#) and [H01Q 19/195](#) take precedence)}
- H01Q 15/004 . . . { using superconducting materials or magnetised substrates}
- H01Q 15/0046 . . . { Theoretical analysis and design methods of such selective devices}
- H01Q 15/0053 . . { Selective devices used as spatial filter or angular sidelobe filter}
- H01Q 15/006 . . { Selective devices having photonic band gap materials or materials of which the material properties are frequency dependent, e.g. perforated substrates, high-impedance surfaces}
- H01Q 15/0066 . . . { said selective devices being reconfigurable, tunable or controllable, e.g. using switches}
- H01Q 15/0073 . . . { said selective devices having corrugations}
- H01Q 15/008 . . . { said selective devices having Sievenpipers' mushroom elements}
- H01Q 15/0086 . . { said selective devices having materials with a synthesized negative refractive index, e.g. metamaterials or left-handed materials}
- H01Q 15/0093 . . { having a fractal shape}
  
- H01Q 15/02 . Refracting or diffracting devices, e.g. lens, prism
- H01Q 15/04 . . comprising wave-guiding channel or channels bounded by effective conductive surfaces substantially perpendicular to the electric vector of the wave, e.g. parallel-plate waveguide lens

- H01Q 15/06 .. comprising plurality of wave-guiding channels of different length
- H01Q 15/08 .. formed of solid dielectric material
- H01Q 15/10 .. comprising three-dimensional array of impedance discontinuities, e.g. holes in conductive surfaces or conductive discs forming artificial dielectric (leaky-waveguide aerials [H01Q 13/28](#))
- H01Q 15/12 .. functioning also as polarisation filter {(polarisation converters [H01Q 15/242](#))}
- H01Q 15/14 . Reflecting surfaces; Equivalent structures {(electromagnetic shields [H01Q 1/526](#); radar-reflecting targets in general [F41J 2/00](#))}
- H01Q 15/141 .. {Apparatus or processes specially adapted for manufacturing reflecting surfaces}
- H01Q 15/142 ... {using insulating material for supporting the reflecting surface}
- H01Q 15/144 .... {with a honeycomb, cellular or foamed sandwich structure}
- H01Q 15/145 .. {comprising a plurality of reflecting particles, e.g. radar chaff (missiles of the signal type provided with means for disseminating radar-reflecting chaff [F42B 12/70](#))}
- H01Q 15/147 .. {provided with means for controlling or monitoring the shape of the reflecting surface (for scanning [H01Q 3/01](#); aerials or aerial systems providing multiple beamwidths [H01Q 25/002](#))}
- H01Q 15/148 .. {with means for varying the reflecting properties ([H01Q 15/147](#) takes precedence)}
- H01Q 15/16 .. Curved in two dimensions, e.g. paraboloidal
- H01Q 15/161 ... {Collapsible reflectors}
- H01Q 15/162 .... {composed of a plurality of rigid panels}
- H01Q 15/163 .... {inflatable}
- H01Q 15/165 ... {composed of a plurality of rigid panels (collapsible [H01Q 15/161](#))}
- H01Q 15/166 .... {sector shaped}
- H01Q 15/167 .... {comprising a gap between adjacent panels or group of panels, e.g. stepped reflectors}
- H01Q 15/168 ... {Mesh reflectors mounted on a non-collapsible frame}
- H01Q 15/18 .. comprising plurality of mutually inclined plane surfaces, e.g. corner reflector {(H01Q 15/16 takes precedence)}
- H01Q 15/20 ... Collapsible reflectors
- H01Q 15/22 .. functioning also as polarisation filter {(in combination with polarising devices [H01Q 15/24](#))}
- H01Q 15/23 . Combinations of reflecting surfaces with refracting or diffracting devices
- H01Q 15/24 . Polarising devices; Polarisation filters (devices functioning simultaneously both as polarisation filters and as refracting or diffracting devices or as reflectors [H01Q 15/12](#), [H01Q 15/22](#))
- H01Q 15/242 .. {Polarisation converters}
- H01Q 15/244 ... {converting a linear polarised wave into a circular polarised wave (guided wave [H01P 1/17](#))}
- H01Q 15/246 ... {rotating the plane of polarisation of a linear polarised wave (guided wave [H01P 1/165](#))}
- H01Q 15/248 .... {using a reflecting surface, e.g. twist reflector (combination with a polarisation filter in dual reflector antennas [H01Q 19/195](#))}
- H01Q 17/00 **Devices for absorbing waves radiated from an aerial; Combinations of such**

**devices with active aerial elements or systems** {(anechoic chambers [G01R 29/105](#))}

- H01Q 17/001 . {for modifying the directional characteristic of an aerial}
- H01Q 17/002 . {using short elongated elements as dissipative material, e.g. metallic threads or flake-like particles}
- H01Q 17/004 . {using non-directional dissipative particles, e.g. ferrite powders ([H01Q 17/005](#) takes precedence; flake-like [H01Q 17/002](#))}
- H01Q 17/005 . {using woven or wound filaments; impregnated nets or clothes}
- H01Q 17/007 . {with means for controlling the absorption}
- H01Q 17/008 . {with a particular shape ([H01Q 17/007](#) takes precedence)}

**H01Q 19/00** **Combinations of primary active aerial elements and units with secondary devices, e.g. with quasi-optical devices, for giving the aerial a desired directional characteristic** {(combination of horns with slotted waveguide array [H01Q 13/0233](#))}

- H01Q 19/005 . {Patch antenna using one or more coplanar parasitic elements}
- H01Q 19/02 . Details {(fastening of an element on a boom [H01Q 1/1228](#))}
- H01Q 19/021 .. {Means for reducing undesirable effects}
- H01Q 19/022 ... {for reducing the edge scattering of reflectors}
- H01Q 19/023 ... {for reducing the scattering of mounting structures, e.g. of the struts}
- H01Q 19/025 ... {for optimizing the matching of the primary feed, e.g. vertex plates}
- H01Q 19/026 ... {for reducing the primary feed spill-over}
- H01Q 19/027 ... {for compensating or reducing aperture blockage (offset feeding [H01Q 19/132](#), [H01Q 19/192](#))}
- H01Q 19/028 ... {for reducing the cross polarisation}
- H01Q 19/04 .. Means for collapsing H-aerials or Yagi aerials
- H01Q 19/06 . using refracting or diffracting devices, e.g. lens {(radome [H01Q 1/42](#))}
- H01Q 19/062 .. {for focusing}
- H01Q 19/065 ... {Zone plate type antennas}
- H01Q 19/067 .. {using a hologram}
- H01Q 19/08 .. for modifying the radiation pattern of a radiating horn in which it is located {(corrugated horns [H01Q 13/0208](#); producing a circular polarisation [H01Q 13/0241](#))}
- H01Q 19/09 .. wherein the primary active element is coated with or embedded in a dielectric or magnetic material (protective material [H01Q 1/40](#); with variable characteristics [H01Q 3/44](#))
- H01Q 19/10 . using reflecting surfaces
- H01Q 19/102 .. {wherein the surfaces are of convex toroidal shape (biconical horns [H01Q 13/04](#))}
- H01Q 19/104 .. {using a substantially flat reflector for deflecting the radiated beam, e.g. periscopic}

- antennas (periscopic fed Cassegrain antennas **H01Q 19/19C3**; passive relays [H04B 7/145](#))}
- H01Q 19/106 .. {using two or more intersecting plane surfaces, e.g. corner reflector antennas}
- H01Q 19/108 .. {Combination of a dipole with a plane reflecting surface ([H01Q 19/106](#) takes precedence; strip line [H01Q 9/065](#))}
- H01Q 19/12 .. wherein the surfaces are concave ([H01Q 19/18](#) takes precedence)
- H01Q 19/13 ... the primary radiating source being a single radiating element, e.g. a dipole, a slot, a waveguide termination ([H01Q 19/15](#) takes precedence)
- H01Q 19/132 .... {Horn reflector antennas; Off-set feeding}
- H01Q 19/134 .... {Rear-feeds; Splash plate feeds}
- H01Q 19/136 ..... {cross-polarised}
- H01Q 19/138 .... {Parallel-plate feeds, e.g. pill-box, cheese aerials}
- H01Q 19/15 ... the primary radiating source being a line source, e.g. leaky waveguide aerials
- H01Q 19/17 ... the primary radiating source comprising two or more radiating elements ([H01Q 19/15](#), [H01Q 25/00](#) take precedence)
- H01Q 19/175 .... {arrayed along the focal line of a cylindrical focusing surface}
- H01Q 19/18 .. having two or more spaced reflecting surfaces ({surfaces of convex toroidal shape [H01Q 19/102](#); using a deflecting plane mirror [H01Q 19/104](#); splash plate feeds [H01Q 19/134](#)}; producing pencil beam by two cylindrical reflectors with their focal lines orthogonally disposed [H01Q 19/20](#))
- H01Q 19/185 ... wherein the surfaces are plane
- H01Q 19/19 ... comprising one main concave reflecting surface associated with an auxiliary reflecting surface
- H01Q 19/191 .... {wherein the primary active element uses one or more deflecting surfaces, e.g. beam waveguide feeds}
- H01Q 19/192 .... {with dual offset reflectors}
- H01Q 19/193 .... {with feed supported subreflector (splash plate feeds [H01Q 19/134](#))}
- H01Q 19/195 .... wherein a reflecting surface acts also as a polarisation filter or a polarising device
- H01Q 19/20 . Producing pencil beam by two cylindrical focusing devices with their focal lines orthogonally disposed
- H01Q 19/22 . using a secondary device in the form of a single substantially straight conductive element
- H01Q 19/24 .. the primary active element being centre-fed and substantially straight, e.g. H-aerial
- H01Q 19/26 .. the primary active element being end-fed and elongated
- H01Q 19/28 . using a secondary device in the form of two or more substantially straight conductive elements (log-periodic aerials [H01Q 11/10](#); constituting a reflecting surface [H01Q 19/10](#))
- H01Q 19/30 .. the primary active element being centre-fed and substantially straight, e.g. Yagi-aerial
- H01Q 19/32 .. the primary active element being end-fed and elongated
- H01Q 21/00** **Aerial arrays or systems** (producing a beam the orientation or the shape of the directional pattern of which can be changed or varied [H01Q 3/00](#); {combination of imbricated aerials or arrays operating on different wavebands [H01Q 5/0006](#)};



electrically-long aerials [H01Q 11/00](#))

### NOTE

This group includes:

- arrays comprising two or more individually energised similar active aerial units spaced apart;
- combinations of different types of active aerials or arrays;
- combinations of substantially independant non-interacting active aerials or arrays.

- |              |   |
|--------------|---|
| H01Q 21/0006 | . {Particular feeding systems}  |
| H01Q 21/0012 | .. {Radial guide fed arrays}  |
| H01Q 21/0018 | .. {Space- fed arrays}  |
| H01Q 21/0025 | .. {Modular arrays}   |
| H01Q 21/0031 | .. {Parallel-plate fed arrays; Lens-fed arrays (multibeam arrays <a href="#">H01Q 25/008</a> )}   |
| H01Q 21/0037 | .. {linear waveguide fed arrays}  |
| H01Q 21/0043 | ... {Slotted waveguides (combination with horns <a href="#">H01Q 13/0233</a> )}   |
| H01Q 21/005  | .... {Slotted waveguides arrays}  |
| H01Q 21/0056 | ..... {Conically or cylindrically arrayed}  |
| H01Q 21/0062 | ..... {the slots being disposed around the feeding waveguide}   |
| H01Q 21/0068 | ... {Dielectric waveguide fed arrays}   |
| H01Q 21/0075 | .. {Stripline fed arrays ( <a href="#">H01Q 21/065</a> takes precedence)}   |
| H01Q 21/0081 | ... {using suspended striplines}  |
| H01Q 21/0087 | . {Apparatus or processes specially adapted for manufacturing antenna arrays (manufacturing waveguides <a href="#">H01P 11/00</a> )}  |
| H01Q 21/0093 | .. {Monolithic arrays}  |
| H01Q 21/06   | . Arrays of individually energised active aerial units similarly polarised and spaced apart   |
| H01Q 21/061  | .. {Two dimensional planar arrays}  |
| H01Q 21/062  | ... {using dipole aerials; ( <a href="#">H01Q 21/067</a> , <a href="#">H01Q 21/068</a> take precedence)}  |
| H01Q 21/064  | ... {using horn or slot aerials (slotted waveguides arrays <a href="#">H01Q 21/005</a> )}   |
| H01Q 21/065  | ... {Patch antenna array}   |
| H01Q 21/067  | ... {using endfire radiating aerial units transverse to the plane of the array}   |
| H01Q 21/068  | ... {using parallel coplanar travelling wave or leaky wave aerial units ( <a href="#">H01Q 21/065</a> takes precedence)}  |
| H01Q 21/08   | .. the units being spaced along or adjacent to a rectilinear path {(waveguide fed <a href="#">H01Q 21/0037</a> )}   |
| H01Q 21/10   | ... Collinear arrangements of substantially straight elongated conductive units   |
| H01Q 21/12   | ... Parallel arrangements of substantially straight elongated conductive units (travelling-wave aerials comprising transmission line loaded with transverse elements, e.g. "fishbone" aerial <a href="#">H01Q 11/04</a> ) |
| H01Q 21/14   | .... Adcock aerials   |

- H01Q 21/16 . . . . . U-type
- H01Q 21/18 . . . . . H-type
- H01Q 21/20 . . the units being spaced along or adjacent to a curvilinear path {[slotted waveguide arrays H01Q 21/005](#); [circularly or helically slotted waveguides H01Q 21/0062](#)}
- H01Q 21/205 . . . {[providing an omnidirectional coverage \(turnstile aerials H01Q 21/26\)](#)}
- H01Q 21/22 . . Aerial units of the array energised non-uniformly in amplitude or phase, e.g. tapered array, binomial array
- H01Q 21/225 . . . {[Finite focus antenna arrays](#)}
- H01Q 21/24 . . Combinations of aerial elements or aerial units polarised in different directions for transmitting or receiving circularly and elliptically polarised waves or waves linearly polarised in any direction {([circularly polarised patch antennas H01Q 9/0428](#); [circularly polarised horns H01Q 13/0241](#); [cross-polarised horns H01Q 13/0258](#); [polarisation converters H01Q 15/242](#); [cross-polarised rear feeds H01Q 19/136](#); [crossed polarisation dual antenna H01Q 25/001](#))}
- H01Q 21/245 . . {[provided with means for varying the polarisation \(polarising devices H01Q 15/24; tracking by comparing linear polarisation compounds G01S 3/146; reducing depolarisation effects H04B 7/00 polarisation diversity H04B 7/10\)](#)}
- H01Q 21/26 . . Turnstile or like aerials comprising arrangements of three or more elongated elements disposed radially and symmetrically in a horizontal plane about a common centre
- H01Q 21/28 . . Combinations of substantially independent non-interacting aerial units or systems {([multiple beam H01Q 25/00](#))}
- H01Q 21/29 . . Combinations of different interacting aerial units for giving a desired directional characteristic ([H01Q 25/00 takes precedence](#))
- H01Q 21/293 . . {[one unit or more being an array of identical aerial elements \(adaptive arrays H01Q 3/2605\)](#)}
- H01Q 21/296 . . . {[Multiplicative arrays](#)}
- H01Q 21/30 . . Combinations of separate aerial units operating in different wavebands and connected to a common feeder system
- H01Q 23/00 Aerials with active circuits or circuit elements integrated within them or attached to them**

**NOTE**

Group [H01Q 23/00](#) includes only such combinations in which the type of aerial or aerial element is immaterial. Combinations with a particular type of aerial are classified in the group appropriate to that type.

- H01Q 25/00 Aerials or aerial systems providing at least two radiating patterns (arrangements for changing or varying the orientation or the shape of the directional pattern [H01Q 3/00](#))**
- H01Q 25/001 . . {[Crossed polarisation dual antennas \(orthomode horns H01Q 13/0258; cross-polarised rear feeds H01Q 19/136; orthomode transducers H01P 1/161\)](#)}
- H01Q 25/002 . . {[providing at least two patterns of different beamwidth; Variable beamwidth antennas](#)}

- H01Q 25/004
  - {providing two or four symmetrical beams for Janus application}
- H01Q 25/005
  - {providing two patterns of opposite direction; back to back antennas ([H01Q 25/004](#) takes precedence)}
- H01Q 25/007
  - {using two or more primary active elements in the focal region of a focusing device (for operation on different wavebands **H01Q 5/00C2**)}
- H01Q 25/008
  - {lens fed multibeam arrays}
- H01Q 25/02
  - providing sum and difference patterns (multimode aerials [H01Q 25/04](#))
- H01Q 25/04
  - Multimode aerials {(corrugated horns [H01Q 13/0208](#))}